

Off Ramsay, Isle of Man, this species is abundant on shells dredged from the Scallop-banks.]

#### EXPLANATION OF PLATE VII.

- Fig. 1. *Coryne vaginata*, Hincks (Ann. ser. 3. vol. viii. p. 295), from a tracing of Lister's figure of *Coryne* in the Phil. Transact.: 1 a, the cup-like expansion of the polypary.  
 Fig. 2. Gonophore of *Eudendrium insigne*, Hincks.  
 Fig. 3. *Ætea recta*, Hincks.  
 Fig. 4. *Membranipora curvirostris*, Hincks.

#### VII.—Further Observations on some Novel Phases of Organic Life at great depths in the Sea. By Dr. G. C. WALLICH.

To the Editors of the *Annals and Magazine of Natural History*.

GENTLEMEN,

In the course of some experiments conducted by me, with a view to ascertain the relation subsisting between the sarcode contents and the calcareous shells of the Foraminifera, a fact so curious revealed itself, as to suggest the possibility of its being rendered available for the solution of various questions in microscopic analysis.

A deep-sea deposit containing numerous Foraminiferous shells, principally *Globigerina*, was subjected to the action of fluoric acid, both at the ordinary temperature and at the boiling-point. When subjected to boiling for a period of about a couple of minutes, entire solution of the calcareous, silicious, and vitreous (volcanic) particles took place, and the masses of sarcode were disintegrated and broken up into extremely minute somewhat acicular granules. These granules, however, in all probability, do not consist of pure sarcode, but of that substance or its elements in combination with fluoric and silicic acids. Seen under the microscope, they did not serve to throw any new light on the characters of sarcode, either with or without the employment of the polariscope.

The portion of deposit submitted only to a momentary immersion in cold fluoric acid gave off a copious discharge of carbonic acid; but on being carefully washed and examined under the microscope, little or no effect seemed to have been produced on the majority of the *Globigerina*-shells, beyond a reduction in the thickness of the walls in some, and in others what appeared to be an alteration in the outline of the superficial elevations, which, in the case of the older shells, are conical and present a zeolite-like aspect when fractured.

The silicious organisms and vitreous particles were very partially affected, the micaceous scales remaining quite intact.

On mounting the shells acted on in the latter mode, some in balsam, some dry, all depolarizing effect was destroyed, there being no coloration in a single specimen; whilst all trace was obliterated of the remarkable and distinctive black cross ordinarily presented by *Globigerina* when viewed under the polariscope. On the other hand, the micaceous tablets retained their full depolarizing properties, and evolved the most brilliant colour.

Again, the bodies detected by me in the deep-sea deposits and which I denominated Coccospheres\*, as indicative of their relation to the Coccoliths of Professor Huxley, though abundantly present in the material operated on, were not destroyed by the cold acid. But the minute black crosses which they evoke when observed under the polariscope were, in like manner with that of the perfect *Globigerina*-shells, wholly obliterated.

In a few shells a change of crystalline structure appeared to have taken place, inasmuch as the bold conical elevations already referred to were replaced by crystals of the cubical series, resembling in all respects the natural crystals of the fluoride of calcium. Accordingly, it is probable that, notwithstanding the transitory period of their immersion, the carbonic was replaced by fluoric acid, and the peculiar depolarizing power resident in the normal arrangement of particles destroyed.

On the other hand, it is possible, although hardly probable, that an entirely new combination, dependent on alterations induced in the sarcodic matter with which the *Globigerina*-shells and, I believe, the Coccospheres and Coccoliths are, in a measure, invested, may have exercised a similar action as regards depolarization.

At all events, we are here furnished with a new and simple method of testing microscopically for carbonate of lime—a salt which enters largely into the composition of so many marine and other deposits, and is associated with so many of the minute organisms that frequent both salt and fresh water.

My own time being already fully occupied, I must leave the further investigation of the matter to others. Perhaps I may be permitted to remark that no one is more competent to extract the true significance of the fact than Mr. Sorby, whose researches on Pseudomorphs are so well known.

Meanwhile, may I request you will do me the favour to insert this notice in 'The Annals?'

I remain, Gentlemen,

Your obedient and obliged servant,

G. C. WALLICH.

\* See a notice by me in the Ann. & Mag. of Nat. Hist. No. 43 (ser. 3. vol. viii.), and the article on the so-called Crystalloids of the Chalk, by Mr. Sorby, in No. 45.